

HARA et al.
Application No. 09/873,406
September 29, 2003

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (canceled)
2. (previously amended) The plane commutator as claimed in claim 14, wherein each said metal base plate includes a dent for accommodating shaved powder formed when said projection of each said commutator segment is fitted to said engagement hole.
3. (previously amended) The plane commutator as claimed in claim 14, wherein each said engagement hole has an corner edge for shaving an outer periphery of one of said projections.
4. (previously amended) The plane commutator as claimed in claim 3, wherein said corner edge has a curved surface whose radius is less than 0.2 mm.
5. (previously amended) The plane commutator as claimed in claim 14, wherein said projection has a tapering portion at an edge thereof.

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6. (previously amended) The plane commutator as claimed in claim 14, wherein each said plurality of commutator segments comprises a commutator surface portion providing said commutator surface and a commutator base portion providing said projection, and

said commutator base portion has lower electric resistance than said commutator surface portion.

7. (previously amended) The plane commutator as claimed in claim 6, wherein said commutator base portion includes metal powder.

8-13. (canceled)

14. (previously presented) A plane commutator including a plurality of commutator segments providing a flat commutator surface, a plurality of metal base plates, a resinous boss member for holding said commutator segments and said metal base plates;

wherein each of said commutator segments comprises a commutator surface portion for forming a portion of said flat commutator surface at one end thereof, a base portion and a projection projecting from the center of said base portion;

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wherein each of said metal base plates has an engagement hole to which said projection is fitted and a terminal portion extending along an outer periphery of said boss member; and

wherein said base portion has a groove for holding powder that comes off said projection around said projection.

15. (previously presented) The plane commutator as claimed in claim 14, wherein said groove is a ring-shaped groove.

16. (previously presented) The plane commutator as claimed in claim 14, wherein said groove is formed at a surface of said base portion opposite said metal base plate.

17. (previously presented) The plane commutator as claimed in claim 14, wherein said engagement hole has a dent on a side adjacent said base portion.

18. (previously presented) The plane commutator as claimed in claim 2, wherein the metal base plate is a metal press-formed plate.

19. (new) A plane commutator comprising:

a plurality of commutator segments providing a flat commutator surface;

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a plurality of metal base plates; and

a resinous boss member for holding said commutator segments and said metal base plates;

wherein each of said commutator segments comprises a commutator surface portion for forming a portion of said flat commutator surface at one end thereof, a base portion and a projection projecting from the center of said base portion;

each of said metal base plates has an engagement hole to which said projection is fitted and a terminal portion extending along an outer periphery of said boss member; and

a space is formed around said projection between each of said metal base plates and the base portion of each of said commutator segments to hold powder that comes off said projection around said projection.

20. (new) The plane commutator as claimed in claim 19, wherein each said engagement hole has an edge corner for shaving an outer periphery of one of said projections.

21. (new) The plane commutator as claimed in claim 20, wherein said edge corner has a curved surface whose radius is less than 0.2 mm.

22. (new) The plane commutator as claimed in claim 21, wherein said projection has a tapering portion at an edge thereof.

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23. (new) The plane commutator as claimed in claim 22, wherein each said plurality of commutator segments comprises a commutator surface portion providing said commutator surface and a commutator base portion providing said projection, and said commutator base portion has lower electric resistance than said commutator surface portion.

24. (new) The plane commutator as claimed in claim 23, wherein said commutator base portion include metal powder.

25. (new) The plane commutator as claimed in claim 19, wherein said space is a ring-shaped groove.

26. (new) The plane commutator as claimed in claim 25, wherein said groove is formed in said base portion opposite said metal base plate.

27. (new) The plane commutator as claimed in claim 19, wherein said engagement hole has a dent on a side adjacent said base portion.